EXHIBIT N

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 1              UNITED STATES DISTRICT COURT

 2            NORTHERN DISTRICT OF CALIFORNIA

 3                  SAN JOSE DIVISION

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 6   IN RE:  HIGH-TECH EMPLOYEE     )

 7   ANTITRUST LITIGATION           )

 8                                  )   No. 11-CV-2509-LHK

 9   THIS DOCUMENT RELATES TO:      )

10   ALL ACTIONS.                   )

11   _____)

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14          CONFIDENTIAL - ATTORNEYS' EYES ONLY

15       VIDEO DEPOSITION OF KEVIN M. MURPHY, Ph.D.

16                  December 3, 2012

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20   REPORTED BY:  GINA V. CARBONE, CSR NO. 8249, RPR, CCRR

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12:19:35 1   vary across the defendants?

12:19:37 2   A.   For a couple of reasons. One is the more scope

12:19:41 3   you have to individualize. And the more scope you have

12:19:47 4   to do that in ways that are maybe less directly

12:19:50 5   observable to people, or -- which is one of the reasons

12:19:54 6   why people can use different forms of compensation.

12:19:58 7   That can make it easier to give people -- you don't have

12:20:00 8   to make it so permanent as you would with salary. So if

12:20:03 9   you want to give somebody an extra amount, and you do it

12:20:08 10   through equity or through a bonus, it's not as permanent

12:20:12 11   than if you do it through a salary component. Gives you

12:20:17 12   more flexibility.

12:20:19 13   Q.   Okay. So what is your support -- well, let me

12:20:26 14   back up. Are you saying that this increased flexibility

12:20:30 15   that comes with -- well, remember individualization

12:20:35 16   could be formulaic, right? So it doesn't necessarily

12:20:40 17   imply increased flexibility, right?

12:20:42 18   A.   But usually you set those formulas up to give

12:20:45 19   you some flexibility. You are trying to individualize

12:20:46 20   things, but this has actually been accepted in the

12:20:53 21   economics literature, where people have talked about the

12:20:56 22   use of bonuses as opposed to just salary as a way to

12:21:01 23   provide additional flexibility for firms to both reward

12:21:06 24   individuals as well as adjust compensation as times

12:21:09 25   change.

12:21:11 1   Q.   So what is your support for the proposition

12:21:13 2   that this variability would materially change the

12:21:20 3   operation of internal equity across these different

12:21:24 4   firms -- or materially change the way internal equity

12:21:26 5   would apply across these different firms? What's your

12:21:29 6   support for that?

12:21:30 7   A.   Because of the fact that if you have more

12:21:33 8   variation -- it's a matter of economics. If I have

12:21:36 9   greater ability to differentiate pay, then that will

12:21:39 10   allow me to do more.

12:21:42 11   Q.   Are you saying that internal equity is

12:21:44 12   inconsistent with differentiation of pay?

12:21:46 13   A.   No. I'm not saying internal equity is -- I'm

12:21:51 14   just saying the more -- more methods I have to

12:21:54 15   individualize pay, the easier it is to do.

12:21:58 16   Q.   Can't individualization of pay sometimes serve

12:22:04 17   internal equity?

12:22:04 18   A.   Yes. I think -- well, in the sense -- not

12:22:07 19   equity in the sense of paying everybody the same, but

12:22:09 20   equity in the sense of paying people based on

12:22:11 21   performance.

12:22:12 22   Q.   Fair -- we agree equity doesn't mean equality.

12:22:17 23   We completely agree.

12:22:19 24   All right. So this is the last thing we're

12:22:23 25   going to do and then we'll take our lunch break. I'm

12:22:29	1	going to hand you now --
12:22:30	2	What number are we on?
12:22:31	3	THE REPORTER: 413.
12:22:32	4	MR. GLACKIN: I'm going to hand you what
12:22:33	5	Mr. Hinman gave me this morning.
12:22:47	6	(Whereupon, Exhibit 413 was marked for
12:22:47	7	identification.)
12:22:48	8	MR. GLACKIN: Q. So, Dr. Murphy, I thought
12:22:51	9	it would be helpful, since I have very little idea
12:22:53	10	of what this is, I just know what Mr. Hinman said
12:22:56	11	before. Maybe before we have the lunch break you
12:22:58	12	can give me the Readers' Digest version of this.
12:23:01	13	A. It would be the complete version because it's
12:23:03	14	pretty simple. First of all, if you look at the row
12:23:05	15	boxes -- the boxes to the right, they're nothing more
12:23:08	16	than the sum of all those numbers in a row. We thought
12:23:11	17	that would be helpful to add the sum of those numbers.
12:23:14	18	Because one of the things you do when you look at this
12:23:17	19	table is start adding up those numbers, so it would be
12:23:19	20	just as easy to have them in the table. So the ones on
12:23:22	21	the right are nothing more than the sum of the row
12:23:25	22	numbers.
12:23:26	23	Now, if you look at the bold black numbers that
12:23:30	24	are there, those numbers are helpful in the sense that
12:23:33	25	if you add them up all the way across, you get total

03:10:21 1   Compensation by Milkovich and Newman?

03:10:27 2   A. I haven't seen that particular textbook, no.

03:10:29 3   Q. So you don't know one way or the other whether

03:10:31 4   or not it's an influential textbook?

03:10:37 5   A. It may be. It may be -- I don't know one way

03:10:39 6   or the other what people use these days, but those kinds

03:10:42 7   of textbooks, there is a lot of similarity across them.

03:10:45 8   People get hung up on one of them at one point in time,

03:10:48 9   but the material tends to be pretty similar across

03:10:53 10   different textbooks.

03:10:56 11   Q. Are you familiar with what are know as

03:11:02 12   "administrative pay systems"?

03:11:07 13   A. I don't know that particular term.

03:11:09 14   Q. Are you familiar with the term "job analysis"

03:11:13 15   as that term is used by industrial and organizational

03:11:19 16   psychologists?

03:11:20 17   A. I'm familiar with the kind of job analysis that

03:11:21 18   people have done; for example, in looking at job

03:11:26 19   characteristics for the Dictionary of Occupational

03:11:30 20   Titles -- that's an old concept, there is a new one

03:11:32 21   that's taken its place, I don't remember the name of

03:11:34 22   it -- where they analyze the kinds of jobs and the

03:11:39 23   skills required and things like that. If that's what

03:11:41 24   you are talking about, I've seen that kind of analysis.

03:11:46 25   Q. Why would -- what are some of the reasons that

03:11:47 1   companies would perform a job analysis?

03:11:50 2   A. Oh, a lot of times to know the kind of people

03:11:52 3   they need to have perform those jobs. And, you know,

03:11:55 4   what kinds of skills are required for the workers that

03:11:57 5   they should hire into those jobs. Help them better

03:12:01 6   administer their internal assignments in hiring.

03:12:08 7   Q. So I'd like you to consider a situation where

03:12:11 8   an employer has a mix of employees. Some of them are

03:12:14 9   being paid minimum wages, some of them are not. The

03:12:19 10   minimum wage goes up. In that situation, will the wages

03:12:23 11   of workers earning above the minimum wage also go up?

03:12:27 12   A. Is it an empirical matter? Not much. There is

03:12:30 13   very little push when a minimum wage goes up. There is

03:12:34 14   a small amount very close to the minimum, but I think

03:12:37 15   most of the empirical research has said that there is

03:12:40 16   not much push for people above the minimum.

03:12:44 17   Q. But it does go up a little bit?

03:12:46 18   A. That's what you would expect even absent

03:12:48 19   equity.

03:12:50 20   Q. So I take it your position is that this change

03:12:55 21   in wages does not demonstrate the existence of internal

03:13:00 22   equity?

03:13:00 23   A. Not in the least, no. That would be perfectly

03:13:03 24   well explained by other forces. In fact, since it

03:13:06 25   happens across firms and not just within firms, it's

03:13:08 1   hard to see why it would be associated with equity.

03:13:16 2   Q. So let's talk about the defendants. Let's turn

03:13:29 3   to paragraph 81.

03:13:46 4   So I'd like to, I guess, draw your attention to

03:13:48 5   the next page. Page 45. So where 81 carries over --

03:13:55 6   well, the sentence beginning -- I'm sorry, the sentence

03:13:58 7   beginning on 44 where it begins, "Based on my interviews

03:14:01 8   with compensation managers," and then continues over.

03:14:03 9   Do you see that sentence?

03:14:04 10   A. Yes.

03:14:05 11   Q. Okay. One thing I would like to clarify is you

03:14:12 12   say that after you conclude -- state your conclusion

03:14:18 13   about substantial flexibility, you say, "with individual

03:14:23 14   merit (and relevant ranking), and not just 'internal

03:14:29 15   equity,' important in explaining compensation

03:14:31 16   adjustments."

03:14:32 17   And the thing I'm wondering is, do you agree

03:14:35 18   with me that internal equity is a factor that the

03:14:39 19   defendants used to set compensation?

03:14:42 20   A. I think it's one thing that they take some

03:14:44 21   account of. An internal equity. But they also look to

03:14:53 22   reward performance. That was a very strong thing that I

03:14:56 23   think most firms try to do. And these firms in

03:14:59 24   particular stressed a desire to have pay for

03:15:03 25   performance.

03:15:03 1   Q. Are those two things inconsistent?

03:15:05 2   A. No. They're not -- they're not inconsistent.

03:15:08 3   But it does mean if people are more valuable, that you

03:15:12 4   can pay them more without paying other people more.

03:15:17 5   Q. So --

03:15:18 6   A. Certainly people that are distantly related

03:15:23 7   within the firm.

03:15:29 8   Q. So in the -- then you describe some different

03:15:39 9   approaches to compensation at the different firms. And

03:15:44 10   I guess what I'm wondering is, are you -- are you saying

03:15:49 11   here -- and then, I'm sorry -- and then you conclude

03:15:51 12   here, the last sentence is, "This implies that any

03:15:54 13   impact working through a somewhat rigid wage structure

03:15:57 14   would require employer-specific analyses that Dr. Leamer

03:16:05 15   does not conduct."

03:16:06 16   Are you saying that the flexibility within the

03:16:10 17   defendants' compensation systems, are you saying that

03:16:12 18   rules out the possibility of common impact in this case,

03:16:17 19   or are you saying that the flexibility means that there

03:16:20 20   is an analysis that needs to be performed that wasn't

03:16:22 21   performed?

03:16:23 22   A. I would say it invalidates Professor Leamer's

03:16:29 23   analysis is really what it does. That -- when you look

03:16:34 24   at the data, there is substantial flexibility that they

03:16:37 25   had and exercised in setting individual compensation and

04:54:26 1   basically the kind of results you get based on noise.

04:54:32 2   So I ran that regression. Just the first thing

04:54:35 3   that came to my mind. I said, well, you know, I know

04:54:38 4   this regression really suffers from a lack of precision

04:54:41 5   and it's really going to capture the impact of this

04:54:44 6   variable that varies over time, so I tried that one.

04:54:53 7   Q. So can we look at paragraph 20 -- excuse me,

04:54:59 8   paragraph 24 of your report, please.

04:55:29 9   That's okay. I think I got the wrong

04:55:31 10   paragraph. So why don't -- all right. Let's move on.

04:55:47 11   I have the wrong paragraph.

04:55:50 12   Did Dr. Leamer take into account revenues, firm

04:55:55 13   revenues in his regression?

04:55:56 14   A. That was one of the variables he used.

04:55:58 15   Q. Do you recall in your report that you

04:56:01 16   criticized him for taking -- for not taking into

04:56:04 17   consideration that a highly successful movie at Pixar

04:56:08 18   might result in bonuses to all the employees?

04:56:11 19   A. That was one of the firm-specific factors that

04:56:15 20   would not be in his regression.

04:56:17 21   Q. Okay. Wouldn't a highly successful movie at

04:56:20 22   Pixar increase firm revenues?

04:56:23 23   A. It could, although the timing may be an issue.

04:56:25 24   Because depending on when that came in and when the

04:56:28 25   bonuses are paid, they may actually be across years.

04:56:32 1   Q.   So why would Dr. Leamer's regression, if it

04:56:35 2   includes a variable for firm revenues, not capture

04:56:40 3   whatever effect there was from Pixar having a highly

04:56:43 4   successful movie?

04:56:45 5   A.   Because there could be -- you know, it's not

04:56:47 6   just going to be a function of revenues, because

04:56:49 7   revenues can be growing because the firm is growing, and

04:56:52 8   that's not going to have nearly the same effect on

04:56:55 9   compensation as would a better performing movie at a

04:56:59 10   given point in time.

04:57:01 11   So, you know, revenues is not really the

04:57:03 12   driver. Depends on why revenues went up. An increase

04:57:06 13   in revenues, driven by the fact that the firm got bigger

04:57:09 14   and had more movies, wouldn't generate the same bonuses

04:57:12 15   that a highly successful movie -- you could have 20

04:57:15 16   percent increase in revenues because the firm grew.

04:57:20 17   That presumably wouldn't have the same or nearly the

04:57:23 18   same effect on compensation as would a highly successful

04:57:27 19   movie in a given year. The regression is going to say

04:57:31 20   if you just put revenues in there, it's going to be

04:57:34 21   revenues regardless of the source.

04:57:37 22   Q.   Isn't Dr. Leamer actually using revenues per

04:57:40 23   employee?

04:57:41 24   A.   But still, again, it depends on why revenues

04:57:45 25   are going up. I'm just saying the other problem you

04:57:47 1   have is what year did the revenue show up in. You could

04:57:51 2   be talking about compensation in one year and, you know,

04:57:53 3   whether the revenue showed up in a prior year or the

04:57:56 4   next year. It's not going to be a perfect control.

04:57:58 5   And, in fact, if you look at -- look at the

04:58:02 6   results, I mean, you can see the results for Pixar in

04:58:07 7   terms of the residuals in his regression. There are

04:58:10 8   some big residuals from Pixar that clearly weren't

04:58:13 9   explained by revenues.

04:58:15 10   Let me go on. Because he has revenues -- he

04:58:18 11   has the same coefficient for every company. So an

04:58:24 12   increase of revenues at Pixar isn't going to have the

04:58:26 13   same effect as the increase in revenues at Intel. If

04:58:30 14   Pixar has this bonus policy where they give you weeks of

04:58:34 15   bonus based on how successful the movie is but Intel

04:58:37 16   doesn't have a corresponding policy, his regression is

04:58:40 17   not going to pick it up because he's using one

04:58:43 18   coefficient for both companies.

04:58:47 19   Q. So you are saying that Pixar's increased

04:58:51 20   revenues are not captured in this regression? Increased

04:58:56 21   revenues as a result of a successful movie?

04:58:57 22   A. Let's say when revenues go up at Pixar there is

04:59:00 23   a big increase in compensation because they have this

04:59:04 24   movie-based bonus, but at Intel when revenues go up,

04:59:07 25   they don't have that same bonus system. His regression

06:10:08   1   A.   It means in a classical statistical problem, it

06:10:12   2   means I achieved a result in terms of my estimate that

06:10:19   3   is typically, say, large relative to what I would expect

06:10:22   4   to happen just by chance.

06:10:26   5   So in other words, in a world where there were

06:10:28   6   no true effect, or no true difference, for example, in a

06:10:32   7   given sample, you are going to find a difference. Even

06:10:35   8   if the true -- say I had two populations and I was

06:10:38   9   comparing population A and population B, and I had

06:10:41 10   samples from each population, and I was going to

06:10:43 11   calculate the average height from my samples.

06:10:46 12   Even if the true average height in both

06:10:49 13   populations is the same, in my sample there is going to

06:10:52 14   be a difference in the average height of the sample from

06:10:55 15   population A and the average height from the sample of

06:10:59 16   population B.

06:11:00 17   The test of statistical significance is did I

06:11:02 18   get a difference in heights across those two populations

06:11:07 19   that was too big to happen just by chance. And the way

06:11:12 20   we quantify that is to say, did I get a difference in

06:11:16 21   heights that would happen less than 5 percent of the

06:11:19 22   time just by chance. That's really the idea of

06:11:22 23   statistical significance.

06:11:24 24   Q.   Okay. Do you agree that this is a

06:11:31 25   description -- that statistical significance is a

06:11:33 1   description of how certain a statistical result is?

06:11:40 2   A. Yeah. It's not just -- it's a description of

06:11:45 3   how precisely I can estimate something, yeah. Somewhat

06:11:50 4   of a description. I mean, if you are just going to talk

06:11:54 5   about significance and not talk about the components

06:11:56 6   that go into it, then you might say it's -- it could be

06:12:00 7   described in terms of certainty.

06:12:05 8   Q. Is there any authority for -- well, is it your

06:12:10 9   opinion -- now, again, I don't want to invite you to

06:12:13 10   launch into -- excuse me. I don't want to invite you to

06:12:16 11   a discursive answer of your reviews about Dr. Leamer's

06:12:20 12   regression. I'd really like to stick to answers to the

06:12:22 13   question.

06:12:24 14   Is it your opinion that in order for a

06:12:26 15   statistical analysis to be reliable, it must produce a

06:12:30 16   statistically significant result?

06:12:32 17   A. Not necessarily. That doesn't have to be true.

06:12:36 18   Q. So --

06:12:38 19   A. But statistical significance is one thing you

06:12:39 20   do look at. And particularly here, you can look at the

06:12:44 21   P values, for example, that show up in the table.

06:12:49 22   Q. Okay. So where are you directing me to? Are

06:12:55 23   you on your report or Dr. Leamer's report?

06:12:57 24   A. In my report. So you look at table, say, 22B.

06:13:11 25   Q. Is this appendix 22B or Exhibit 22B?

06:13:14 1   A.   Exhibit 22B or Exhibit 22A.   Either one.   We

06:13:17 2   can go with A, it's the first one.

06:13:20 3   Q.   Uh-huh.   Okay.

06:13:22 4   A.   So these would be the P values, which is the

06:13:25 5   probability that that you get a number at least that big

06:13:28 6   just by chance.   And you can see for lots of these,

06:13:34 7   there -- these are from his estimates that restrict the

06:13:37 8   coefficients across.   You get a lot of these P values 50

06:13:42 9   percent, which means it's a number -- I'm going to get a

06:13:45 10   number that size half the time just by chance.   Kind of

06:13:49 11   what those numbers mean.

06:13:51 12   Q.   You say there is a lot that are 50 percent?

06:13:53 13   A.   I'm saying there is ones that are 50 percent,

06:13:55 14   30 percent, 40 percent.   There is a few that are

06:13:58 15   smaller.   But, you know, the majority of them are, you

06:14:03 16   know, 30 percent or higher.   That means a third of the

06:14:06 17   time I'm going to get a number like that just by chance.

06:14:20 18   Q.   So --

06:14:27 19   A.   And remember, this is just looking for an

06:14:29 20   average effect, let alone asking the question whether

06:14:32 21   there is a common effect.

06:14:35 22   Q.   So if I wanted to look at some authority for

06:14:38 23   the proposition that these P values are a basis to

06:14:44 24   reject Dr. Leamer's regression analysis, what authority

06:14:48 25   should I look at?

1   I, Gina V. Carbone, Certified Shorthand

2   Reporter licensed in the State of California, License

3   No. 8249, hereby certify that the deponent was by me

4   first duly sworn and the foregoing testimony was

5   reported by me and was thereafter transcribed with

6   computer-aided transcription; that the foregoing is a

7   full, complete, and true record of said proceedings.

8   I further certify that I am not of counsel or

9   attorney for either of any of the parties in the

10   foregoing proceeding and caption named or in any way

11   interested in the outcome of the cause in said caption.

12   The dismantling, unsealing, or unbinding of

13   the original transcript will render the reporter's

14   certificates null and void.

15   In witness whereof, I have hereunto set my

16   hand this day: December 6, 2012.

17   _____ Reading and Signing was requested.

18   _____ Reading and Signing was waived.

19   ___X___ Reading and signing was not requested.

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22   _____

23   GINA V. CARBONE

24   CSR 8249, RPR, CCRR

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 1                UNITED STATES DISTRICT COURT

 2              NORTHERN DISTRICT OF CALIFORNIA

 3                    SAN JOSE DIVISION

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 6   IN RE:  HIGH-TECH EMPLOYEE      )

 7   ANTITRUST LITIGATION            )

 8                                   )   No. 11-CV-2509-LHK

 9   THIS DOCUMENT RELATES TO:       )

10   ALL ACTIONS.                    )

11   _____ )

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14       VIDEO DEPOSITION OF KEVIN M. MURPHY, Ph.D.

15                      VOLUME II

16                    July 5, 2013

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19   REPORTED BY:  GINA V. CARBONE, CSR NO. 8249, RMR, CCRR

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09:56:51   1   So does observing wide variation in

09:56:53   2   compensation changes for individuals in the same job

09:56:56   3   allow you to rule out the possibility that their

09:57:02   4   compensation changes have relationship to one another or

09:57:05   5   an effect on one another?

09:57:07   6   A.   I guess I would say there is two ways to think

09:57:09   7   about that. First, as a purely statistical matter.

09:57:13   8   And, you know, as a purely statistical matter, you could

09:57:15   9   say, well, they're clearly all not moving together. You

09:57:18 10   know, all moving by the same amount because that's why

09:57:21 11   there is variation. You know, the more variation you

09:57:23 12   see, the less you think, well, it's likely that they're

09:57:27 13   moving together.

09:57:29 14   That's just a pure statistical side. The

09:57:32 15   economic side actually is a little stronger because once

09:57:34 16   you sort of realize that the firm can and does move

09:57:37 17   people individually, and then you say, okay, that one

09:57:41 18   guy gets a cold call, given I have the ability to move

09:57:45 19   people individually and I routinely do that, you would

09:57:48 20   think you have an incentive to do that here.

09:57:50 21   And if people normally see people getting moved

09:57:53 22   around for various reasons, they're not going to say

09:57:55 23   well, holy cow, what happened, why did that guy get

09:58:00 24   moved, because people get moved all the time. So I

09:58:03 25   think the second, the economic argument cuts stronger

09:58:05 1   against the hypothesis than the purely statistical one.

09:58:10 2   On the purely statistical side, as I said

09:58:12 3   earlier, it's very hard to prove a zero from a

09:58:15 4   statistical standpoint because once you have all this

09:58:18 5   noise and people moving, it's hard to know whether there

09:58:21 6   is something else hidden by all that noise.

09:58:24 7   So I think on the purely statistical side, I

09:58:27 8   think it's best to say the way I did here, which is you

09:58:30 9   can't presume it's there. But once you have that, the

09:58:34 10 economics sort of goes a step further and says, well,

09:58:36 11 that tells me it's economic force away from having his

09:58:40 12 hypothetical be true.

09:58:41 13   Q. So are you saying that a wide variation in

09:58:49 14 compensation changes for individuals in the same job is

09:58:51 15 inconsistent with internal equity having any effect on

09:58:57 16 the magnitude or degree of those compensation changes?

09:59:00 17 Are you saying those two things are inconsistent?

09:59:02 18   A. I'm not saying it's inconsistent. I'm saying,

09:59:04 19 look -- first of all, you can't presume that there was

09:59:07 20 an increase for other people. Secondly, the fact that

09:59:11 21 you are able to make those kind of distinctions, coupled

09:59:14 22 with the economic incentives to minimize cost, it says

09:59:16 23 you are going to do what you can to avoid raising those

09:59:19 24 other people.

09:59:21 25   To prove that it's absolutely zero at the end

09:59:23 1 of the day, to say, can I prove the hypothesis that he's

09:59:28 2 putting forward is definitively untrue? I don't think,

09:59:32 3 like I said, you can't prove a zero. But to me, that

09:59:39 4 wasn't the question that the judge asked. He asked --

09:59:41 5 the judge, I mean she asked, would it necessarily do

09:59:45 6 these things. And to me, "necessarily" has an

09:59:50 7 implication that it's not -- just it's conceivable that

09:59:54 8 it could happen. Necessary and conceivable seem to me

09:59:59 9 to be distinct words.

10:00:00 10   Q. So you would agree that even if you -- let's

10:00:02 11 say you are looking at a particular job title, you see

10:00:04 12 compensation changes of different magnitude and even of

10:00:08 13 different sign. You agree with me that if a firm is

10:00:11 14 seeking to observe internal equity, that that seeking to

10:00:16 15 observe internal equity may restrict the magnitude and

10:00:19 16 difference -- the magnitude of the differences in the

10:00:22 17 compensation changes.

10:00:23 18   Do you agree with me that's possible?

10:00:25 19   A. It's conceivable that something like that could

10:00:27 20 happen. I don't think there is evidence -- the bigger

10:00:29 21 the variation, the less evidence there is that that is

10:00:32 22 going on. The bigger the variation you see, the less

10:00:36 23 the economics tells us you would expect that to be

10:00:38 24 happening. Because, again, you have the ability to

10:00:43 25 differentiate people. And if you can, you would take

| 10:00:46 | 1 | advantage of it. |

10:00:48   2   Q.   So can I direct your attention to paragraph 22,

10:01:02   3   please. Excuse me -- yes. So you see the -- a few

10:01:14   4   lines down there is a sentence beginning, "Economics

10:01:16   5   tells us"?

10:01:19   6   A.   Yes.

10:01:19   7   Q.   Okay. So when you're referring here to what

10:01:25   8   economics tells us that what is relevant in

10:01:27   9   understanding the rigidity of a firm's compensation

10:01:30 10   structure is the extent to which compensation of

10:01:32 11   alternative job titles deviate from one another, is that

10:01:35 12   the same -- the same concept we've been talking about

10:01:37 13   that an employer would have an incentive not to pay

10:01:40 14   people the same thing in your -- as I understand you to

10:01:43 15   be saying?

10:01:43 16   MR. HINMAN: Object to the form.

10:01:45 17   THE WITNESS: I'm saying the incentive would be

10:01:47 18   if for some reason I have to give -- there is a

10:01:49 19   particularly hot market out there, for example, for

10:01:51 20   people in this job, and if I want to keep my people, and

10:01:54 21   I want to be competitive and attract new hires and

10:01:57 22   stuff, I got to raise that pay. If I can get away

10:02:00 23   without raising everybody else's pay, that's going to be

10:02:03 24   a lot cheaper. It's going to be something I would

10:02:06 25   desire to do as an employer.

10:02:09 1   And so if I have that ability, if I routinely

10:02:12 2   do this, then people in the firm are used to seeing

10:02:15 3   relative wages move for different groups. And they

10:02:19 4   don't say, well, wow, what's going on, there is

10:02:22 5   something breaking with tradition here, it's part of the

10:02:26 6   regular ordinary course of business.

10:02:27 7   MR. GLACKIN: Q. So in other words, if

10:02:29 8   they -- if an employee is sort of accustomed to

10:02:34 9   seeing big changes in how people are paid, then that

10:02:37 10   employee is not going to feel they're being treated

10:02:39 11   unfairly if they see another change in compensation;

10:02:42 12   is that what you are trying to say?

10:02:44 13   A.   I guess what I'm saying, they're going to say

10:02:46 14   that's part of the process. That's the firm I'm in.

10:02:49 15   I'm in a firm that differentiates pay, and, you know,

10:02:52 16   any one change there becomes less noticeable.

10:02:54 17   If I was in a world in which everybody always

10:02:56 18   got paid the same and suddenly they made a distinction

10:02:59 19   for somebody, that would really raise eyebrows and

10:03:02 20   people would say, "God, that's out of line with the

10:03:05 21   policies that we've observed in the past." And I think

10:03:08 22   you have to take that into account.

10:03:13 23   It also shows me that the firm does this. That

10:03:15 24   the firm does take advantage of the ability. It's not

10:03:18 25   just that he can do it, they do do it. That's also a

10:03:21   1   big part of the story; that they -- they deviate from

10:03:27   2   moving everyone together.

10:03:29   3   Q.   So my question is -- I'm trying to understand

10:03:32   4   what you are saying. If I've got it wrong, just tell me

10:03:35   5   I've got it wrong. But what it seems to me you are

10:03:38   6   saying, if an employee is accustomed to seeing big

10:03:41   7   changes in compensation of workers around him, he's not

10:03:44   8   going to feel treated unfairly the next time he sees

10:03:47   9   that happen. It's about how the employee feels; is

10:03:50 10   that -- is that what you are saying?

10:03:52 11   A.   Look, I can't get inside the guy's head. What

10:03:55 12   I'm saying is in a world in which these kind of

10:04:00 13   movements happen routinely, the -- the effect -- the

10:04:07 14   pressure on the employer not to move things is just not

10:04:10 15   as strong, because it's something that people are used

10:04:12 16   to seeing. It's not going to create any kind of red

10:04:15 17   flag among people. It's not going to be out of keeping

10:04:17 18   with what we normally see.

10:04:20 19   And it also tells me that employers are making

10:04:23 20   distinctions. They're not -- for a variety of reasons.

10:04:26 21   Not just because who's, you know, got an attractive job

10:04:32 22   market at the moment. They're making distinctions for

10:04:35 23   lots of reasons.

10:04:36 24   Q.   Did you do any investigation into whether or

10:04:37 25   not your clients, these defendants, actually cared about

10:04:42 1   maintaining some level of equity among the compensation

10:04:47 2   of their employees? Did you look at documents or

10:04:50 3   deposition excerpts on that issue?

10:04:52 4   A.   I've seen that -- you know, I saw, for example,

10:04:55 5   I read Professor Hallock's report and some of the things

10:04:59 6   he talks about there, some of which I had seen. You

10:05:04 7   know, I don't think there is anything that I'm saying

10:05:07 8   that's at all inconsistent with the existence of some

10:05:09 9   attention to that.

10:05:12 10   I think what I'm saying is much more focused on

10:05:16 11   what they do. It's not so focused on kind of, you know,

10:05:21 12   trying to read from the documents. The court can read

10:05:26 13   the documents. I'm an economist. I got no particular

10:05:29 14   advantage of reading documents. I'm probably worse at

10:05:32 15   reading documents than most people. My strength is I

10:05:35 16   can look at data, and that's what I tried to do.

10:05:39 17   Q.   So why is it okay to read employee declarations

10:05:43 18   and not to look at internal documents? Why are you

10:05:46 19   better suited to base your conclusions based on sworn

10:05:49 20   declarations of employees as opposed to deposition

10:05:52 21   testimony and documents?

10:05:53 22   A.   You and I -- you mischaracterized grossly what

10:05:56 23   I said last time. I told you I looked at those because

10:05:59 24   I just wanted background on what was going on. Those

10:06:01 25   weren't the source of my opinions. I read those as a

10:06:06   1   background for my analysis. My analysis was focused on

10:06:09   2   the empirical work last time, and I told you that ten

10:06:13   3   times in our deposition last time. And you chose to

10:06:18   4   kind of, let's say, selectively quote what I had to say.

10:06:28   5   And, you know, same thing here. I looked at

10:06:30   6   those things, I think they provide some -- you know,

10:06:35   7   something that's in the background. But it's the

10:06:37   8   empirical analysis that I can do. And it's not

10:06:40   9   ultimately my decision what the final decision is.

10:06:42 10   That's up to the court. And I just need to try to

10:06:45 11   provide the input I can provide. I need to provide some

10:06:48 12   economics that can help, not to make decisions about all

10:06:52 13   those things, and I got no advantage at those things.

10:06:56 14   Q.   So when you say that economics tells us that

10:07:01 15   the wide variation implies what you are saying it

10:07:08 16   implies, do you have any authority for that proposition?

10:07:10 17   A.   Yeah. The theory of cost minimization. Not --

10:07:14 18   you know, I know that a firm, if they need to raise

10:07:18 19   wages for an individual or group of individuals, will

10:07:21 20   minimize its cost if it can minimize the scope over

10:07:24 21   which it has to increase compensation. That's basic

10:07:29 22   economics together with arithmetic.

10:07:33 23   Q.   Can you cite us to any specific economics or

10:07:36 24   specific authorities on this point, which is that wide

10:07:38 25   variation in compensation implies the things that you

10:07:43   1 say it implies?

10:07:48   2   A.   I think, I guess, you could talk about, you

10:07:50   3 know, take standard personnel economics on pay for

10:07:55   4 performance and those issues. There's certainly a

10:08:02   5 literature there. I can't give you the specifics. I'm

10:08:05   6 sure Ed Lazear has specifics on that. But it's really

10:08:09   7 more the combination of just basic economics and some

10:08:11   8 facts. That's all it is.

10:08:12   9   THE VIDEOGRAPHER: Excuse me. I'm getting a

10:08:19 10 little microphone cord noise there. Thank you.

10:08:21 11   MR. GLACKIN: Should we put them on the lapels?

10:08:23 12 Would that be better?

10:08:23 13   THE VIDEOGRAPHER: It's fine right there.

10:08:24 14   MR. MITTELSTAEDT: We've been going for an hour

10:08:25 15 when you get to a convenient breaking point.

10:08:32 16   MR. GLACKIN: Okay. Just a couple more

10:08:33 17 questions.

10:08:35 18   Q.   How are you doing, Dr. Murphy?

10:08:39 19   A.   Having loads of fun.

10:08:42 20   Q.   Okay.

10:08:45 21   A.   I'm being facetious, by the way.

10:08:48 22   Q.   I gathered.

10:08:49 23   A.   Well, on the transcript you can't tell. On the

10:08:51 24 video it will be obvious.

10:08:55 25   Q.   So -- I wouldn't assume that.

10:08:57   1   So when you say Ed Lazear has specifics on

10:09:01   2   that, are you saying that Ed Lazear -- can you cite us

10:09:06   3   to any specific source in the compensation literature,

10:09:12   4   which is vast, which says that if a company regularly

10:09:17   5   pays its employees differently or changes their

10:09:20   6   compensation in different ways or by different amounts,

10:09:22   7   then it doesn't need to worry that they're going to be

10:09:25   8   concerned about whether or not that's fair.

10:09:27   9   MR. HINMAN: Object to the form.

10:09:28 10   THE WITNESS: I never said they wouldn't need

10:09:29 11   to worry. I'm just saying that demonstrates that they

10:09:32 12   have the ability to differentiate, because they do. And

10:09:37 13   when you have the ability to differentiate, you have the

10:09:41 14   incentive to take advantage of that. And that's really

10:09:43 15   all -- that's really what I'm saying.

10:09:46 16   And I'm also saying from the point of view of

10:09:50 17   any inference that an employee might be making. The

10:09:52 18   more things are already moving, the less one can infer

10:09:56 19   anything about any one movement. That's just basic

10:10:00 20   properties of statistical inference.

10:10:02 21   That, you know, it's much easier to learn in a

10:10:05 22   world in which things are not moving for other reasons

10:10:07 23   than it is in a world where things are moving for other

10:10:10 24   reasons. And the more variation there is, the less sort

10:10:13 25   of signal extraction even that an individual employee is

10:10:19 1 going to be able to engage in.

10:10:20 2   MR. GLACKIN: Q. Can you conclude, just by

10:10:24 3 looking at changes in individual employee

10:10:26 4 compensation, that internal equity does not put any

10:10:28 5 restriction on -- or limit in any way the amount by

10:10:31 6 which those changes are different?

10:10:34 7   A. I don't think you would want to say that. I

10:10:36 8 don't think that's what I'm saying. I'm just saying --

10:10:38 9 I'm making an observation that's based on economics.

10:10:42 10 And it goes as far as it can go.

10:10:45 11   You know, if you want absolutes, talk to God.

10:10:48 12 Because, you know, economics and statistics aren't going

10:10:51 13 to give you absolutes. I mean, you are going to be able

10:10:55 14 to say, look, I go this far, maybe I go farther, but

10:10:59 15 economics and statistics ain't going to give you that.

10:11:02 16   MR. GLACKIN: That's a good breaking point.

10:11:04 17 Let's go off the record, please.

10:11:05 18   THE VIDEOGRAPHER: We are now off the record at

10:11:07 19 10:11.

10:11:08 20   (Recess taken.)

10:25:18 21   THE VIDEOGRAPHER: We are now on the record at

10:25:19 22 10:25.

10:25:22 23   MR. GLACKIN: Q. Welcome back, Dr. Murphy.

10:25:24 24   Can we look at paragraph 16, please, of your

10:25:28 25 report. Your June report.

10:25:36   1   Okay. So I think you alluded to this earlier,

10:25:39   2   but I just wanted to make sure we were talking about the

10:25:41   3   same thing.

10:25:42   4   In the third line you say here that when you

10:25:46   5   examine the changes, you eliminated systematic impacts

10:25:51   6   on compensation that reflect age, tenure, gender and job

10:25:57   7   title. So can you explain a little bit what that means,

10:26:00   8   please.

10:26:01   9   A.   Yeah. I mean, you could think about it as sort

10:26:04 10   of I want to compare an individual, what happened to

10:26:09 11   them, did it happen to somebody who has done the same

10:26:12 12   job, with the same gender, with the same age, and the

10:26:16 13   same tenure.

10:26:17 14   Now, if you literally tried to match people and

10:26:21 15   sort of, you know, find somebody that's identical to

10:26:24 16   them in all those dimensions, most cases you wouldn't be

10:26:27 17   able to find somebody who is a literal match.

10:26:30 18   So what we did is we used a regression to

10:26:33 19   create kind of what somebody -- we would predict

10:26:35 20   somebody of their age, tenure, gender, and job title

10:26:39 21   would have happened to them, and then say how -- what

10:26:44 22   happened to this individual relative to that prediction.

10:26:47 23   So that prediction sort of serves the role of

10:26:52 24   that comparator person. It's kind of like an average

10:26:55 25   person -- that's what a regression really does. It kind

10:35:35   1   Q.   And this is a percent change in compensation

10:35:38   2   from 2007 to 2008?

10:35:39   3   A.   Right. I believe these are percent changes.

10:35:41   4   Most of the -- a little bit confusing at times, because

10:35:46   5   some are changes in logs which economists often call

10:35:49   6   percentages. And we can have -- I have a long

10:35:52   7   discussion with my class about why that's the nice thing

10:35:55   8   to do. But these are actually percentages, and some of

10:35:59   9   the other ones are logs.

10:36:01 10   Q.   And is this a percent -- is this the actual

10:36:05 11   percent change in compensation level, or is this

10:36:08 12   relative to the hypothetical person where you've

10:36:15 13   controlled for age, tenure, et cetera?

10:36:17 14   A.   I think -- let me look through Exhibit 2. I

10:36:23 15   think Exhibit 2 -- because we do some controlled and

10:36:24 16   some not. I'm trying to remember. I don't want to

10:36:27 17   misstate what it is. It's in the text.

10:36:31 18   Q.   Exhibit 2 is paragraph 15.

10:36:33 19   A.   Yeah. I don't think Exhibit 2 -- I don't think

10:36:37 20   Exhibit 2 controls for all those characteristics. So

10:36:40 21   those would be raw.

10:36:41 22   We've also done ones that control for

10:36:44 23   characteristics, I think. Yeah.

10:36:56 24   Q.   So Exhibit 2 is raw?

10:36:58 25   A.   I think so. I mean, we've done it both ways.

10:37:01	1	I'm pretty sure -- it certainly reads from the text that
10:37:03	2	this is raw.
10:37:04	3	Q. Okay. So if I'm in --
10:37:06	4	A. It doesn't -- I should tell you, correcting for
10:37:09	5	characteristics makes a very small difference. Because
10:37:12	6	most of -- when you look at changes, most of it is not
10:37:15	7	systematically explained by characteristics.
10:37:18	8	So for example, I know for a number of these
10:37:20	9	charts, we have the ones with or without characteristics
10:37:24	10	and text, and then we have -- in the backup, we have the
10:37:27	11	corresponding charts done the other way. And they're
10:37:30	12	very similar.
10:37:32	13	Q. So when you say the change is not mostly
10:37:34	14	explained by common characteristics, do you agree with
10:37:38	15	me that in terms of the absolute level, that the common
10:37:42	16	characteristics explain most of the compensation levels?
10:37:47	17	MR. HINMAN: Object to the form.
10:37:48	18	THE WITNESS: It depends on what you mean by
10:37:50	19	characteristics. Within a job, no. Job has a lot of
10:37:56	20	explanatory power for pay. There is no question. But
10:37:59	21	it's kind of, again, hard to know even how to interpret
10:38:03	22	that. Like is that causal or who you put where?
10:38:08	23	MR. GLACKIN: Q. So -- sorry.
10:38:09	24	A. So what I'm saying is within a job, even in
10:38:12	25	levels, characteristics don't explain that much.

10:38:15	1	Gender, age, tenure; they have relatively small effects.
10:38:20	2	If you remember back to Professor Leamer's
10:38:22	3	regressions where he was doing those cross-section
10:38:24	4	regressions, you know, 90 percent of what -- 95 percent
10:38:28	5	of what he was getting was coming from the job effects.
10:38:31	6	That's pretty standard.
10:38:33	7	Q. Okay. Then if we flip to Exhibit 3, which you
10:38:39	8	were just referencing -- oh, I see. In this we actually
10:38:42	9	see in the heading it says, "adjusted for individual
10:38:45	10	characteristics and jobs."
10:38:47	11	So can you walk us through what Exhibit 3 is?
10:38:49	12	A. Yeah. So I'll -- just to make clear, Exhibit 2
10:38:52	13	controls for the job, because you are looking at
10:38:55	14	everybody in the same job. So job is being controlled,
10:38:57	15	but characteristics aren't. Here's controlling for
10:39:00	16	characteristics and job. And then we're looking at the
10:39:04	17	distribution of individuals relative to that predicted
10:39:08	18	value.
10:39:10	19	So, you know, it's saying how many people fall
10:39:13	20	in each of those bins. Again, think of the bins. Now,
10:39:17	21	the bins are a little different for different firms
10:39:20	22	because some have much wider spread than others. The
10:39:23	23	minimum spread we use is minus 50 to plus 50. For
10:39:27	24	Google, ███
██████████████		███

10:39:33   1   Q.   Is this looking at the each employee's total

10:39:36   2   compensation over the entire period under study?

10:39:38   3   A.   No. It's -- it's year-over-year changes. So

10:39:45   4   each individual might be in here multiple times.

10:39:47   5   Q.   I see.

10:39:47   6   A.   So I'll have my 2005 to 2006 change, and then

10:39:51   7   my 2006 to 2007. Each individual will be in there as

10:39:55   8   ever many times he's got changes.

10:39:57   9   Q.   I see. So if you were in -- say in 2006 you

10:40:02 10   had an increase of five percent over the prediction,

10:40:07 11   that change would be in the big -- the biggest bar in

10:40:10 12   the Adobe chart right to the right of zero.

10:40:12 13   A.   Yes.

10:40:12 14   Q.   And then in 2007, if you had a 10 percent

10:40:15 15   change relative to the prediction, you would be in the

10:40:18 16   next bar. That change would be in the next bar, two

10:40:21 17   bars to the right from zero?

10:40:23 18   A.   Yes.

10:40:23 19   Q.   Okay.

10:40:24 20   A.   Okay.

10:40:30 21   Well, I mean, if you had -- exactly ten is

10:40:32 22   problematic. Make it nine and a half. So ten is the

10:40:35 23   guy who is, like, between the bucket. So....

10:40:37 24   Q.   Fair enough.

10:40:38 25   A.   If you want to make it, like, zero to five,

11:02:23 1   Q. So I take it you agree with me that Professor

11:02:25 2   Manski is a leader in this field?

11:02:29 3   A. I don't know if he still is. I mean, he's been

11:02:33 4   doing it for a while. He certainly was one of the

11:02:35 5   people who pioneered it, yeah.

11:02:37 6   Q. Well, you thought his definition of this was

11:02:40 7   good enough to put it in a report. So is there some

11:02:42 8   part of his definition that you don't like?

11:02:44 9   MR. HINMAN: Object to the form.

11:02:45 10   THE WITNESS: No. I just mostly cited him

11:02:47 11   because usually in academics we give guys credit who did

11:02:50 12   it first, and, you know, he seemed to be the natural

11:02:53 13   place to start.

11:02:54 14   He didn't really do it first, you can dig back

11:02:57 15   further and find other people who talked about similar

11:03:00 16   things. But he's commonly credited as kind of starting

11:03:07 17   the modern literature on that at least.

11:03:09 18   I would actually say the Moffitt piece is

11:03:12 19   probably better in some ways for going into more depth.

11:03:15 20   But as I said, that's partly because Moffitt had the

11:03:19 21   benefit of the reading Manski and the benefit of all

11:03:22 22   this stuff that people have done in the interim.

11:03:24 23   Q. Are you familiar with the ways that Professor

11:03:26 24   Manski suggests that the reflection problem can be

11:03:29 25   remedied?

11:03:30   1   A.   Yeah, there are various ways. They basically

11:03:32   2   come down to finding ways to identify your structure.

11:03:37   3   It's no different than just about any endogenous

11:03:41   4   variable problem. You need to have ways to identify and

11:03:44   5   separate these different sources of movement.

11:03:48   6   There is nothing special about this problem

11:03:51   7   from how do you solve it standpoint. There is no silver

11:03:55   8   bullet. It always comes down to the same question. Can

11:03:58   9   I isolate the sources of variation to capture the causal

11:04:04 10   effects I'm interested in.

11:04:05 11   Q.   Can you tell us some of the ways that Professor

11:04:07 12   Manski suggests doing that?

11:04:10 13   A.   I'd have to go back and read his paper. I

11:04:12 14   think some of the -- some of the ones would be to

11:04:15 15   identify, you know, specific shocks that affect

11:04:20 16   individual groups that you can then trace through the

11:04:23 17   system, which would come under the standard exclusion

11:04:25 18   restriction type identification.

11:04:28 19   You could have differential group membership

11:04:31 20   that can help identify things if you know something

11:04:33 21   about the group membership. There is a bunch of

11:04:36 22   different ways, none of -- none of which Leamer does

11:04:43 23   here.

11:04:43 24   Q.   What about studying lagged effects? Isn't that

11:04:47 25   one way that Professor Manski suggests overcoming the

11:04:51 1   reflection problem?

11:04:52 2   A.   Yes.   If you didn't have other problems with

11:04:54 3   lagged effects.   Lagged effects create their own set of

11:04:57 4   problems as I point out in this effect.   But the lagged

11:05:02 5   effect solution really depends on those lagged effects

11:05:04 6   again having the same kind of exclusion property.

11:05:08 7   Q.   So you -- are you -- again, let's talk about

11:05:11 8   Professor Manski.   Are you willing to agree with me that

11:05:14 9   one way that Professor Manski suggests solving the

11:05:17 10   reflection problem is to study lagged effects?

11:05:20 11   A.   Well, he says if there are lags.   If the

11:05:24 12   effects happen with a lag, then you can kind of separate

11:05:27 13   them out by the temporal orderings of the response.   Of

11:05:34 14   course, Professor Leamer has written a bunch of papers

11:05:37 15   saying why temporal orderings don't provide that kind of

11:05:41 16   inference.

11:05:41 17   Q.   What I'm curious to know is, had you forgotten

11:05:45 18   that Professor Manski said that until I asked you the

11:05:47 19   question or had you known that before I asked you the

11:05:49 20   question?

11:05:50 21   A.   I think I've known it.   Because what you are

11:05:51 22   saying is it's just a special case of what I said

11:05:54 23   before.   You have to be able to identify the source of

11:05:58 24   the shocks.

11:05:59 25   And if you say there is a shock that hits this

11:06:02   1   guy and then it's transmitted at some temporal date to

11:06:06   2   somebody else, you can use that ordering to help

11:06:08   3   identify the system. Simultaneity really causes a

11:06:17   4   problem for the -- for the reflection problem.

11:06:22   5   Q. So when I asked you to tell us the ways that

11:06:24   6   Professor Manski suggests overcoming the reflection

11:06:28   7   problem, why didn't you tell us lagged effects until I

11:06:31   8   specifically reminded you?

11:06:32   9   A. Because they're just a special case of what I

11:06:35 10   did tell you. They're just a restriction about where

11:06:37 11   the effects are coming from. You are saying I got this

11:06:39 12   effect, it hits this one first, then the other one.

11:06:43 13   Q. It's actually the first solution that he

11:06:45 14   suggests in the paragraph immediately following the one

11:06:47 15   that you've quoted in your report, isn't it?

11:06:50 16   A. I don't recall what he says specifically there.

11:06:53 17   But I wouldn't consider what Professor Leamer did in

11:06:58 18   this case a solution to that problem for the reasons

11:07:01 19   laid out.

11:07:02 20   Q. Did you read Professor Manski's article again

11:07:04 21   before -- well, I assume you read the article before --

11:07:06 22   before this whole process started?

11:07:07 23   A. Yes, I have.

11:07:08 24   Q. So did you read it again before -- or in the

11:07:11 25   process of writing your report?

11:07:12 1   A. I did. I don't know if I read every paragraph

11:07:14 2   but I read a good chunk of it.

11:07:18 3   Q. Okay. Let's turn -- I'd like to talk to you

11:07:24 4   about, I guess, the endogeneity problem, and it might be

11:07:39 5   best to turn to paragraph 42 now.

11:07:52 6   In paragraph 42, you talk about the model that

11:07:56 7   you developed in the technical appendix where you add

11:08:00 8   factors that account for 50 percent and so forth. I'm

11:08:04 9   talking about the last sentence of paragraph 42.

11:08:06 10   A. Yes.

11:08:07 11   Q. Okay. When you say "add factors," did you

11:08:09 12   actually add any factors in the technical appendix?

11:08:13 13   A. Yeah, I did. I'd have to look at the appendix.

11:08:16 14   But what we're saying is if you take the model and you

11:08:19 15   take the common component, and you say instead of just

11:08:22 16   having the two contemporaneous and lag variables I'm

11:08:27 17   going to add now a variable that -- I guess right now

11:08:31 18   we're just dealing with the reflection problem, so maybe

11:08:33 19   we don't have the lag at this point.

11:08:35 20   We're adding a variable that explains some of

11:08:39 21   the common effect. So the common effects, the sum of

11:08:43 22   two components, half of which is observed and half of

11:08:46 23   which is not observed, and you say to what extent does

11:08:50 24   that solve this problem.

11:08:51 25   Because the true model has no sharing at all,

11:08:53	1	but it looks like they're sharing because you have this
11:08:57	2	common effect. And I said if you added something and
11:09:00	3	explained half of it, you would be left with, you know,
11:09:03	4	the, quote, sharing variable going from .86 to .75.
11:09:09	5	It's like you threw a control in there that in principle
11:09:13	6	accounts for half of the common variation, nonetheless
11:09:16	7	you would still only reduce the coefficient from .86
11:09:19	8	to .75.
11:09:21	9	Q. I guess the thing I'm just trying to make
11:09:23	10	absolutely clear is that when you did this, what you
11:09:25	11	added was sort of a hypothetical variable, not a real
11:09:28	12	world variable representing some actual fact, right?
11:09:31	13	A. Well, no. It would be a real world variable in
11:09:33	14	that context. It's something -- it's a hypothetical
11:09:38	15	exercise, but it corresponds to adding a real world
11:09:42	16	variable that explains half of the common effect.
11:09:47	17	That's really what it says.
11:09:48	18	It says, look, I got these omitted factors,
11:09:52	19	they're causing me to get an upward biased estimate of
11:09:56	20	this fact. Well, what if I corrected and I started
11:09:59	21	measuring some of those and I put those into a
11:10:01	22	regression in an attempt to control, quote, for those
11:10:03	23	observable factors.
11:10:04	24	The answer is, if you had observable factors
11:10:07	25	that explained half of it, you would still have a very

11:10:09 1   large bias. You would still have, you know, 80-plus

11:10:13 2   percent of the bias you had before.

11:10:16 3   Q. So I think we're in agreement that technical

11:10:20 4   appendix A is a hypothetical exercise?

11:10:23 5   A. Yes. It's intended to show how it works.

11:10:27 6   Q. Okay.

11:10:27 7   A. How it works and how it works in theory, so

11:10:31 8   then we can put that next to what actually Professor

11:10:35 9   Leamer does and says, well, you know, what he gets is

11:10:37 10   not very surprising in a world in which there isn't.

11:10:41 11   Even if we were in a world in which there was

11:10:44 12   no sharing whatsoever, the kind of results he gets

11:10:47 13   aren't out of line with that.

11:10:50 14   Q. Well, did you try adding any more variables to

11:10:53 15   account for common influences other than the ones that

11:10:56 16   Dr. Leamer used?

11:11:00 17   A. To that regression?

11:11:01 18   Q. Yes. To the one we're talking about in 42.

11:11:04 19   A. No. I don't think that's a very helpful

11:11:06 20   approach. It's not even clear it makes things better.

11:11:08 21   I think what's clear -- we know that there are

11:11:13 22   substantial omitted factors, because we know that their

11:11:17 23   aggregate compensation at these firms is changing

11:11:20 24   dramatically.

11:11:21 25   Go back to my first report. Look at the

11:11:23 1   year-over-year compensation moves in these firms. Each

11:11:26 2   year there is -- you know, there is big variation year

11:11:28 3   to year in the compensation moves in these companies.

11:11:32 4   So we know that things are happening year -- each year

11:11:36 5   is not like the other year.

11:11:38 6   And, you know, Professor Leamer doesn't -- you

11:11:40 7   know, he calls them, quote, internal factors. But those

11:11:45 8   aren't internal factors, they're just a summary of all

11:11:47 9   the factors. When I tell you compensation of all the

11:11:51 10   other job titles at Apple went up, all you are telling

11:11:55 11   me is the compensation at Apple went up. You are not

11:11:58 12   telling me what caused all those factors to go up. You

11:12:01 13   are not telling me what caused compensation to go up.

11:12:05 14   His theory depends on there being omitted factors.

11:12:08 15   And his theory critically depends, not just

11:12:11 16   that there are omitted factors, but they're not common

11:12:14 17   across groups. They're just a bunch of idiosyncratic

11:12:18 18   factors, each affecting only an individual job that add

11:12:21 19   up to affect a total.

11:12:23 20   Because if he has factors that are omitted from

11:12:26 21   his regression that are correlated with the average,

11:12:31 22   then he's got an endogeneity problem and his results are

11:12:36 23   going to be biased. He has to really depend on the

11:12:39 24   reason that Adobe's compensation went down in the tech

11:12:44 25   bust is a bunch of job-specific elements. Things that

11:12:48   1   were independent across jobs that caused each job,

11:12:50   2   independently for its own purposes, had a downward push

11:12:53   3   in compensation.

11:12:54   4   Yet, if you think about what happened in that

11:12:57   5   year, it was like the tech bust. And the idea that that

11:13:01   6   identifies the sharing parameter is really absurd. The

11:13:07   7   idea that I can learn that there was sharing from the

11:13:10   8   fact that there was a common decrease in compensation at

11:13:13   9   Adobe in that early year, in the tech bust, to me makes

11:13:18 10   no sense. I mean, it's just -- it's crazy.

11:13:25 11   Q.   The only reason I'm looking at you to make sure

11:13:27 12   you are done is he needs to change the tape.

11:13:30 13   Are you done?

11:13:31 14   A.   I'm done.

11:13:32 15   MR. GLACKIN: Okay.

11:13:32 16   THE VIDEOGRAPHER: This is the end of video

11:13:33 17   No. 1 in volume No. 2.

11:13:36 18   We are now off the record at 11:13.

11:13:44 19   (Recess taken.)

11:17:04 20   THE VIDEOGRAPHER: We are now on the record at

11:17:06 21   11:17.

11:17:07 22   This is the beginning of video No. 2 in volume

11:17:10 23   No. 2.

11:17:11 24   MR. GLACKIN: Q. Okay. So can we turn to

11:17:13 25   the technical appendix, please.

11:17:16 1   A. Sure.

11:17:20 2   Q. It's page 29 of your report, if that helps.

11:17:30 3   A. Okay.

11:17:31 4   Q. I'll direct your attention to paragraph 1,

11:17:32 5   second sentence. You say that compensation in each job

11:17:36 6   is determined by two types of factors, one, common

11:17:40 7   factors, firm level success, changes in the general

11:17:47 8   economy, et cetera. And, two, job specific factors, and

11:17:53 9   you list some.

11:17:55 10   So my question to you is -- my first question

11:17:58 11   is, I mean, you would agree with me that Dr. Leamer

11:18:02 12   included a variable in his regression to account for

11:18:04 13   firm level success, right?

11:18:06 14   A. Yeah. It's one measure of firm level success.

11:18:11 15   I don't think that, as I said a moment ago, it certainly

11:18:15 16   doesn't explain the variation year to year in firm level

11:18:21 17   compensation. There is still a lot of firm level

11:18:23 18   compensation that's coming from other places.

11:18:29 19   Q. Okay. Well, you do agree with me that he

11:18:31 20   included a variable that would account for firm level

11:18:34 21   success?

11:18:35 22   A. Absolutely. And I talk about what happens when

11:18:37 23   you do that in my horse race discussion.

11:18:39 24   Q. And you also agree that he included a variable

11:18:43 25   that would account for changes in the general economy,

11:18:45	1	right?
11:18:45	2	A. Yes, he did.
11:18:48	3	Q. So then the substantial omitted factors that
11:18:51	4	you mentioned a minute ago, those would be contained in
11:18:54	5	the "et cetera" part of that parenthetical?
11:18:57	6	A. No. Because his measure of -- first off, his
11:19:00	7	revenue measure of firm level success, if you just look
11:19:02	8	at how it performs, it doesn't perform very well
11:19:05	9	explaining even his earlier regressions compensation.
11:19:10	10	It doesn't account for very much at all.
11:19:12	11	If you look at, you know, his external
11:19:16	12	variable, it works well for some companies, not well for
11:19:20	13	others. Yet we know that there is still tremendous
11:19:26	14	variation at the firm level that's left.
11:19:29	15	So there clearly are these omitted factors he's
11:19:31	16	not taking account of. And it could be there is an
11:19:35	17	amalgamation of idiosyncratic job-specific things that
11:19:39	18	add up at the firm level to what he sees, which is what
11:19:42	19	he's assuming. But that seems like a very odd and, you
11:19:45	20	know, speculative assumption on his part.
11:19:48	21	A much more likely explanation is that there
11:19:51	22	was other systematic factors that maybe we don't even
11:19:54	23	know what they are.
11:19:56	24	Q. Did you identify any substantial omitted
11:20:03	25	factors?

11:20:03	1	A. I mean, I think it's self-evident that they're
11:20:08	2	there. It would be things that, you know, for example
11:20:10	3	for Intel you would have change in their firm level
11:20:14	4	success, driven -- which is somewhat different than the
11:20:17	5	industry as a whole.
11:20:18	6	You have Google had this transformation from
11:20:21	7	being a startup to a later firm, which is why, for
11:20:25	8	example, if you look at the change in San Jose
11:20:33	9	employment, doesn't correlate well at all with success
11:20:35	10	at Google.
11:20:36	11	You have Apple, which sort of had tremendous
11:20:39	12	success in the latter half of the period due to the
11:20:41	13	success of the iPhone and other products. For each
11:20:45	14	firm, it would be something different.
11:20:47	15	For Lucas and Pixar, it would be the success of
11:20:50	16	their films. So you could try to do that. I don't see
11:20:54	17	that as a helpful exercise.
11:20:57	18	Because for one thing, we know that even if you
11:21:03	19	control for other factors, and that's the point of the
11:21:05	20	horse race story, it's not going to solve the problem.
11:21:09	21	Because what's left is still common. You are going to
11:21:13	22	overstate the coefficient on that common variable and
11:21:17	23	understate even all the included factors. This is not
11:21:20	24	just a problem of excluded factors.
11:21:22	25	Q. What's your evidence for the proposition that

11:21:25 1   there are substantial omitted factors?

11:21:26 2   A.   That there is enormous amount of year-to-year

11:21:29 3   variation in these firms' overall compensation that's

11:21:33 4   unexplained by the factors he included.

11:21:37 5   Q.   So you mean it's the fact that there is a

11:21:40 6   variation between overall compensation at Intel and

11:21:45 7   overall compensation at Apple?

11:21:45 8   A.   No. Just look -- go back to my first report

11:21:48 9   and look at the data on year to year compensation growth

11:21:52 10   in these firms. Only a small part of that, in general,

11:21:55 11   is explained by particularly observable factors. That

11:21:59 12   there is lots of other things going on in these

11:22:02 13   companies.

11:22:03 14   And he just takes whatever those variables

11:22:07 15   don't explain and he calls it an internal factor. There

11:22:09 16   is no evidence -- there is no reason that even is

11:22:13 17   internal. I mean, any external factor that has a common

11:22:16 18   influence across people is going to show up there.

11:22:20 19   Q.   Well, we have your -- I'm sorry, were you done?

11:22:22 20   A.   Yes.

11:22:22 21   Q.   We have your first report. So why don't you

11:22:26 22   show us the paragraph or the chart in the first report

11:22:30 23   that is evidence that there are substantial omitted

11:22:33 24   factors.

11:22:35 25   A.   I would say the thing that points you in that

12:02:05 1   path you are on that are temporary.

12:02:09 2   And most economic variables have that kind of

12:02:13 3   element, particularly when you look at things like

12:02:16 4   prices and things. Now, stock prices, very different.

12:02:20 5   Asset prices, we usually think, well, they're going to

12:02:22 6   be closer to a random walk. Like that's the efficient

12:02:27 7   market theory.

12:02:28 8   But for market prices determined in other ways,

12:02:32 9   they often have this sort of stationarity to them where

12:02:36 10   if they go up on average, they're going to tend to come

12:02:39 11   back towards some level.

12:02:40 12   Now, that level to which they're trending may

12:02:42 13   be changing over time. So there may be a trend to the

12:02:45 14   normal level. The key point is that there is some

12:02:48 15   temporary components. And when you think about

12:02:50 16   something like in this case, particularly like equity

12:02:53 17   compensation, and bonuses and things like that, they

12:02:56 18   have a natural temporary component. That's, in some

12:03:00 19   reasons, why you use them rather than just base pay.

12:03:03 20   Q.   So can you cite me to a definition of the

12:03:09 21   regression fallacy that says what you are saying about

12:03:11 22   it?

12:03:13 23   A.   Yeah. I mean, if you just think about -- I

12:03:15 24   don't have a particular book in mind, but if you talk

12:03:18 25   about a stationary time series, it will talk about how

12:03:22   1   that stationary time series is going to regress.

12:03:25   2   Q.   What I asked you is if there is authority that

12:03:27   3   you can cite to me that says that there is something

12:03:29   4   being omitted from the definition of it that I read you.

12:03:33   5   A.   Yeah.   I don't have a particular one in mind.

12:03:35   6   It's just something that economists and econometricians

12:03:39   7   know.   I learned it from Lars Hansen, who is a professor

12:03:45   8   at Chicago, when I took his class years ago.   I mean,

12:03:48   9   it's a pretty simple concept.   I don't think Professor

12:03:51 10   Leamer would disagree.

12:03:53 11   Q.   So you think that the compensation -- in this

12:03:56 12   respect, that the compensation of the defendants is

12:03:59 13   comparable to the weather?

12:04:02 14   A.   In a statistical sense, I think it has some of

12:04:05 15   the same properties.   That it's going to vary.

12:04:08 16   I mean, a better analogy is the salesman

12:04:11 17   example that I gave in the report.   That there are

12:04:15 18   components that are going to move compensation.   I'm in

12:04:18 19   a group.   We have a tremendously successful year.   We

12:04:22 20   develop Google Chrome this year.   We get big bonuses

12:04:25 21   because we develop Google Chrome, you know.   Great

12:04:29 22   project, great idea, things came out really well.

12:04:32 23   We're smart guys, probably next year we're

12:04:35 24   going to do something good, but probably not going to do

12:04:38 25   that again.   So on average you are probably not going to

12:04:41 1 get as good of stock grants, bonuses that you got this

12:04:45 2 year.

12:04:45 3   That's all I'm saying. That's all you need.

12:04:47 4 You need that when you have a really good year, the next

12:04:51 5 year, on average, won't be quite so good. And when you

12:04:53 6 have a really bad year, on average it won't quite be so

12:04:57 7 bad.

12:04:57 8   That's really what mean reversion is about.

12:05:00 9 And you can say, well, that's because there is

12:05:02 10 randomness. But randomness connotes something that's

12:05:07 11 sort of like rolling dice. It's really just that there

12:05:11 12 are things that aren't necessarily repeated year after

12:05:14 13 year.

12:05:14 14   Q. So let's look at your salesman example, which

12:05:18 15 is paragraph 46. Do you want to read it before

12:05:21 16 answering questions about it or are you ready to go?

12:05:24 17   A. I understand it.

12:05:27 18   Q. So in this example, you lay out the possibility

12:05:29 19 that the salesman is paid $75,000, $100,000, or $125,000

12:05:36 20 based on whether it's a bad, average or good year.

12:05:41 21   Are there any salesmen in the technical class?

12:05:46 22   A. No. I didn't -- but if you thought about a

12:05:50 23 group or a project that's being compensated for this,

12:05:52 24 you pay for performance. You are getting compensated

12:05:56 25 based on this year's performance.

01:33:50   1   electronic, they have other ways.

01:33:55   2   Q.   How large is the sample for each occupation?

01:33:59   3   A.   It varies. It varies significantly. There are

01:34:02   4   some -- there are some relatively large occupations.

01:34:06   5   You know, truck drivers or something like that would be

01:34:08   6   a large occupation. There could be some relatively

01:34:11   7   small observations.

01:34:12   8   Q.   What's the total, if you add them all up?

01:34:15   9   A.   I don't remember. I looked at this, you know,

01:34:18 10   back when we first looked at the dataset a few months

01:34:21 11   ago. I don't remember the numbers. But, you know,

01:34:25 12   typical CPS survey used to have, you know, 60,000

01:34:27 13   people. This would have significantly more than that.

01:34:31 14   Q.   Do you know when the survey is administered

01:34:33 15   during the course of the year?

01:34:35 16   A.   It's administered over the year. It's not all

01:34:37 17   at one time, and it looks at the previous 12 months from

01:34:42 18   the date of that survey.

01:34:43 19   Q.   So in other words, somebody who is asked in

01:34:47 20   December of 2006 to report the last 12 months of their

01:34:52 21   compensation is going to report, in theory, 2006. Where

01:34:58 22   somebody who is asked in March of 2007 to report the

01:35:00 23   last 12 months of their compensation, is going to report

01:35:03 24   part of 2006 and part of 2007?

01:35:06 25   A.   That's way the ACS works. The CPS is

01:35:09   1   different. The CPS is an annual survey, at least the

01:35:13   2   earning supplement component, which is done in March,

01:35:15   3   that asks about the prior calendar year. And we've done

01:35:19   4   the same analysis for both. The problem with the CPS,

01:35:22   5   it's an even smaller -- it's a smaller survey.

01:35:25   6   Q. How did you choose which occupations to use in

01:35:28   7   your dataset?

01:35:29   8   A. We used the occupations that were, you know,

01:35:34   9   the consistent codes that they had in there. I don't

01:35:37 10   remember what other choices of occupation codes we had.

01:35:41 11   Q. In that situation, I mean, you broke this data

01:35:45 12   down ultimately on an annual basis, right, to make it an

01:35:49 13   apples to apples comparison?

01:35:52 14   A. Yes. I mean, it's available, actually, in

01:35:54 15   annual chunks. Even though it's collected over the

01:35:56 16   years, it's available like annual surveys even though

01:35:59 17   they're not all done at the same time.

01:36:02 18   Q. So what did you -- how does that treatment deal

01:36:06 19   with the person I outlined who returns the survey in

01:36:10 20   March and reports -- reports a gross figure of the -- of

01:36:14 21   the last 12 months, some of which is 2007 and some of

01:36:17 22   which is 2006?

01:36:18 23   A. Yeah. I mean, you are going to have a range.

01:36:20 24   You are going to have -- if you look at it, you are

01:36:23 25   going to have a range of people. So there is going to

01:36:25   1   be only one person who goes the furthest back, and there

01:36:28   2   is going to be only one group that goes the furthest

01:36:31   3   forward, and then you are going to have a concentration

01:36:33   4   of the data in the middle because there are going to be

01:36:35   5   a bunch of groups that have those, like, say, January is

01:36:39   6   going to be there for, you know, 11 of the 12, or

01:36:43   7   whatever.

01:36:44   8   Because everybody -- everybody who is

01:36:46   9   interviewed after January will have January. Whereas

01:36:49 10   everybody who is -- and then everybody who is -- so

01:36:53 11   that's kind of like the peak one. And then only the one

01:36:56 12   guy at the end will have the last month, and only one

01:36:59 13   guy at the end -- so if you look at the frequency over

01:37:00 14   the months, it will look like a triangle.

01:37:03 15   Q. Is this longitudinal? The study?

01:37:06 16   A. I don't believe it's longitudinal, no.

01:37:08 17   Q. So they're using different people every month?

01:37:11 18   A. That's my understanding. The CPS uses

01:37:14 19   different people every two years. So there is some

01:37:18 20   overlap in the CPS.

01:37:19 21   Q. So how -- I guess I still don't understand.

01:37:21 22   When you are trying to break this data down on an annual

01:37:25 23   basis, how do you account for -- what do you do with

01:37:29 24   someone who is in March -- who is reporting income for

01:37:34 25   the prior 12 months in March of 2007? Do you average

01:37:37 1   the income out over the 12 months? Do you assume they

01:37:40 2   earned it all in 2007?

01:37:41 3   A. We just put them into the 2007 sample. We're

01:37:44 4   not assuming they earned it all in 2007, they're in our

01:37:47 5   2007 sample. And then we'll have a 2006 sample.

01:37:51 6   Q. So you are not assuming they earned it all in

01:37:53 7   2007, but all of that income that they report is going

01:37:55 8   to be assigned to the 2007 sample?

01:37:58 9   A. Yes.

01:37:59 10   Q. Even though you have no idea whether they

01:38:01 11   earned all of it in 2007 or all of it in 2006 or some in

01:38:06 12   both?

01:38:06 13   A. No, I agree. That's how it is.

01:38:17 14   Now, I should say the CPS, which is another

01:38:20 15   dataset, doesn't have that same issue. And we also did

01:38:23 16   the same analysis with the current population survey.

01:38:30 17   Q. And I'm sorry, how did you select the

01:38:32 18   occupations to include in the dataset?

01:38:35 19   A. As I recall, those were the codes that came on

01:38:38 20   the dataset. And I don't remember the precise, you

01:38:44 21   know, whether there were codes that we needed to

01:38:46 22   eliminate or not.

01:38:47 23   Q. Did you drop anybody out of the dataset?

01:38:49 24   A. We did. We selected on the basis of some

01:38:52 25   minimum reported earnings, some minimum hours per week,

01:43:18 1   So that's what I'm saying. If it's that kind

01:43:20 2   of systematic in that it's a permanent directional

01:43:24 3   difference.

01:43:24 4   Q. But what if the bias isn't permanent in the

01:43:27 5   same direction, then you wouldn't be remedying the

01:43:31 6   measurement?

01:43:31 7   A. Then we usually don't think of it as a -- I

01:43:34 8   mean, bias is usually thought of as something that's

01:43:37 9   systematic, as opposed to measurement error varies over

01:43:39 10   time.

01:43:40 11   Q. Let me pose this question then. Are you aware

01:43:42 12   of the fact that when talking about compensated data

01:43:48 13   based on surveys, there is concern about the tendency of

01:43:53 14   high earners to understate their income, and low earners

01:43:57 15   to -- yeah -- high earners to understate and low earners

01:44:02 16   to overstate. Aren't you aware that that's a problem?

01:44:06 17   A. That can be a problem. That actually wouldn't

01:44:08 18   tend to generate measurement error -- I mean, mean

01:44:12 19   reversion. That would just compress the earnings.

01:44:16 20   Q. But it would be measurement error, right?

01:44:18 21   A. No. Not in the sense that you -- not in the

01:44:20 22   sense that would generate mean reversion. Mean

01:44:24 23   reversion wouldn't be generated by that kind of

01:44:26 24   measurement error, per se.

01:44:27 25   Q. So your position is that that kind of

01:44:29 1   measurement error would not generate mean reversion?

01:44:32 2   A. Not per se. The fact that you have that kind

01:44:34 3   of -- I don't think people normally even call that

01:44:37 4   measurement error. They would call that some sort of

01:44:40 5   systematic misreporting. Wouldn't generate mean

01:44:46 6   reversion, per se.

01:44:46 7   Q. Okay. So putting aside the issue of mean

01:44:50 8   reversion, doesn't -- does aggregating the data up to

01:44:55 9   the annual level solve that kind of measurement error?

01:45:00 10 I mean, isn't it possible that someone could be a low

01:45:02 11 earner one year and move out of the category that

01:45:04 12 overreports its income the following year?

01:45:06 13   MR. HINMAN: Object to the form.

01:45:08 14   THE WITNESS: Yeah. But I mean -- but you're

01:45:10 15 averaging over lots of people, so idiosyncratic time

01:45:14 16 measurement here is going to tend to average out.

01:45:16 17 That's the reason you do the averaging.

01:45:18 18   The reason you do the averaging is so that you

01:45:20 19 are left with a more systematic part and the

01:45:27 20 idiosyncratic parts get averaged out.

01:45:29 21   MR. GLACKIN: Q. So did you do anything --

01:45:29 22 you took no steps -- other than -- I'll withdraw the

01:45:32 23 question.

01:45:33 24   Other than aggregating the data at the annual

01:45:37 25 level, did you do anything to correct for measurement

01:45:39   1   error?

01:45:39   2   A. Well, one of the things we did is take the

01:45:42   3   full-time, full-year workers. And this is a lot of my

01:45:46   4   published work I've done in the past has shown that, you

01:45:48   5   know, the biggest sources of measurement error for the

01:45:51   6   low weeks worked, low hours worked groups, so the

01:45:56   7   more -- focusing on the people who work more is a

01:46:00   8   substantial way to reduce measurement error in the

01:46:03   9   reported earnings.

01:46:04 10   Q. So you are saying you excluded anybody who

01:46:08 11   didn't work the whole year?

01:46:09 12   A. No. We -- it's what's usually thought of as

01:46:12 13   full time, full year. Which is you take people who work

01:46:16 14   more than a certain number of weeks and people that work

01:46:18 15   more than a certain number of hours.

01:46:20 16   Because you are really interested in learning

01:46:22 17   about what their pay is, not necessarily how much of the

01:46:25 18   year they worked. That would add a dimension that's

01:46:28 19   really not part of the data we use in this case.

01:46:32 20   Q. So when you say you take people who work more

01:46:34 21   than a certain number of weeks, what was your cutoff?

01:46:38 22   A. I think -- it's a category in these data, and I

01:46:41 23   think it's 48 -- it's probably 48 or more. I don't

01:46:44 24   remember the exact number. It's basically people --

01:46:46 25   what's considered full year. Full year is not 52 weeks

02:05:19 1   Q.   Why did you do that?

02:05:21 2   A.   The first reason I did is because we wanted to

02:05:24 3   replicate what Professor Leamer did and make our dataset

02:05:29 4   as comparable to what he did as we could.

02:05:31 5   Q.   So because you did what he did, does that

02:05:36 6   suggest that you agree with that he did?

02:05:39 7   MR. GLACKIN: Object to the form.

02:05:39 8   THE WITNESS: I think it depends on what you

02:05:41 9   are trying to do. For purposes of showing why the

02:05:46 10 results he got kind of flowed from the structure of the

02:05:50 11 data and, you know, the reflection issues and mean

02:05:54 12 reversion and those kinds of things, I think it was the

02:05:57 13 right thing to do from that perspective.

02:05:59 14   It doesn't mean aggregating it up to that level

02:06:03 15 is the right way to answer the court's question.

02:06:08 16   MR. HINMAN: Okay. Thank you.

02:06:09 17

02:06:09 18   FURTHER EXAMINATION BY MR. GLACKIN

02:06:09 19   MR. GLACKIN: Q. Okay. Dr. Murphy, did

02:06:14 20 you discuss with Mr. Hinman those questions?

02:06:17 21   A.   Yes, we did.

02:06:19 22   Q.   And he told you the questions in advance?

02:06:25 23   A.   I don't know. I think he asked about those

02:06:27 24 issues kind of generally, and I said -- I gave him the

02:06:30 25 answers that -- what my views were.

02:06:33   1   Q.   Did he tell you he was concerned about that

02:06:34   2   testimony you gave earlier?

02:06:36   3   A.   No.

02:06:39   4   MR. TUBACH: No, no, no. You don't get to ask

02:06:40   5   that. You know that.

02:06:42   6   THE WITNESS: He didn't express he was

02:06:44   7   concerned. He asked would you like to explain and I

02:06:46   8   said sure.

02:06:47   9   MR. GLACKIN: Q. Okay. Is there anything

02:06:50 10   wrong with averaging?

02:06:52 11   A.   Depends on what you are trying to do.

02:06:54 12   Q.   Well, I mean isn't averaging a fairly common

02:06:56 13   thing to do in statistics?

02:06:58 14   A.   It is. I mean, depends on what your questions

02:07:01 15   are. I mean, sometimes averaging tells a story,

02:07:04 16   sometimes averaging eliminates the story.

02:07:06 17   Q.   In order to do a regression analysis, don't

02:07:08 18   you, nearly by definition, have to use average data?

02:07:12 19   A.   No. You can use the raw microdata to run a

02:07:16 20   regression. You don't have to use averages.

02:07:18 21   Q.   How many regression analyses have you done over

02:07:20 22   the years?

02:07:22 23   A.   Thousands.

02:07:23 24   Q.   Did many of those regression analyses use

02:07:25 25   average data or aggregated data?

02:07:28   1   A.   Far more used individual level than aggregate

02:07:30   2   data, actually.

02:07:31   3   Q.   Okay. But many of them did use aggregate data,

02:07:34   4   right, Dr. Murphy?

02:07:35   5   A.   Yeah. I've used aggregate data before when

02:07:37   6   aggregate data were appropriate for answering the

02:07:40   7   question.

02:07:41   8   Q.   And isn't the reason you used -- or isn't one

02:07:44   9   reason to use aggregated data or average data in order

02:07:48 10   to detect whether there is some kind of relationship

02:07:52 11   within the data?

02:07:54 12   MR. HINMAN: Object to the form.

02:07:57 13   THE WITNESS: If you are interested in

02:07:58 14   relationships among the averages. If you are interested

02:08:01 15   in relationships with the individuals, averaging

02:08:04 16   necessarily -- isn't necessarily the right thing to do.

02:08:13 17   MR. GLACKIN: Q. Well, won't averaging

02:08:14 18   help you understand the commonalities among the

02:08:20 19   different individual data points by helping factor

02:08:24 20   out things that are idiosyncratic to the particular

02:08:28 21   data?

02:08:29 22   A.   Not necessarily, because it can induce

02:08:31 23   commonalities that aren't there in the individual data.

02:08:34 24   Q.   Are you opposed to using averages

02:08:35 25   philosophically?

02:08:37   1   A.   No.   I told you there is times when they're the

02:08:39   2   appropriate thing to use.

02:08:41   3   Q.   Do you know how old averaging is?

02:08:44   4   A.   I think averaging goes back to the, you know --

02:08:50   5   Q.   Archimedes?

02:08:52   6   A.   -- in terms of people's concept, or when the

02:08:56   7   world actually started averaging things.   Because that

02:08:57   8   goes back even further.   But I'm sure we understood

02:09:01   9   averaging before Archimedes.   I'm sure some of the

02:09:03 10   cavemen understood averaging.

02:09:05 11   Q.   Why would the cavemen understand averaging?

02:09:08 12   A.   Because it's a natural part of everyday

02:09:10 13   existence.   That averaging is the thing that happens

02:09:15 14   when you, you know, put, you know, something -- you

02:09:20 15   know, mix two liquids together and you stir them up.   I

02:09:23 16   mean, you kind of average the stuff together.   I mean,

02:09:25 17   it's a natural part of the world.

02:09:29 18   Q.   Are you familiar with Archimedes?

02:09:33 19   A.   I wouldn't give any one man credit for

02:09:36 20   inventing averaging.   It's a very primitive concept.

02:09:39 21   Q.   You have a great deal of respect for

02:09:41 22   Archimedes, though, I'm sure?

02:09:42 23   A.   Definitely.   I really liked -- I was going to

02:09:45 24   joke, but I wouldn't.

02:09:46 25   MR. GLACKIN: Let's take a break.

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02:09:48   1           THE VIDEOGRAPHER:  We are now off the record at

02:09:50   2    2:09.

02:10:08   3           (Recess taken.)

02:13:37   4           THE VIDEOGRAPHER:  We are now on the record at

02:13:38   5    2:13.

02:13:42   6           MR. GLACKIN:  No further questions.

02:13:44   7           MR. HINMAN:  Nothing here.  Thank you.

02:13:45   8           THE VIDEOGRAPHER:  Okay.  This is the end of

02:13:46   9    video 2 in volume No. 2.

02:13:49  10           It concludes today's proceedings.  The master

02:13:51  11    videos will be retained by Jordan Media.  We are now off

02:13:54  12    the record and the time is 2:13.

02:14:00  13           (The deposition concluded at 2:13 PM)

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1   I, Gina V. Carbone, Certified Shorthand

2   Reporter licensed in the State of California, License

3   No. 8249, hereby certify that the deponent was by me

4   first duly sworn and the foregoing testimony was

5   reported by me and was thereafter transcribed with

6   computer-aided transcription; that the foregoing is a

7   full, complete, and true record of said proceedings.

8   I further certify that I am not of counsel or

9   attorney for either of any of the parties in the

10   foregoing proceeding and caption named or in any way

11   interested in the outcome of the cause in said caption.

12   The dismantling, unsealing, or unbinding of

13   the original transcript will render the reporter's

14   certificates null and void.

15   In witness whereof, I have hereunto set my

16   hand this day: July 6, 2013.

17   _____ Reading and Signing was requested.

18   _____ Reading and Signing was waived.

19   ___X___ Reading and signing was not requested.

20

21

22   _____

23   GINA V. CARBONE

24   CSR 8249, RMR, CRR, CCRR

25